The Effects of Scaffolding on Students’ Self-Regulated Learning Skills

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THE EFFECTS OF SCAFFOLDING ON STUDENTS’ SELF-REGULATED LEARNING SKILLS

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Introduction

Self-regulated learning is the process by which students regulate the progression of their learning and thinking while completing a task. Ifenthaler (2012) describes self-regulated learning as “a balancing act between necessary external support and desired internal regulation” (p. 38). The external support given to students in order to help them to develop their self-regulated learning skills can be in the form of scaffolding. Scaffolding is the process of guiding and prompting students through their learning. In the process of scaffolding the guidance and prompting will eventually fade away as the students reach the intended goals. Scaffolding can come from many different sources including, but not limited to, from computer programs, parents, peers, and teachers. This literature review will look at the effect that each of these scaffolding sources has on students’ development of self-regulated learning skills, as well as recommendations that schools and/or teachers should consider.

Literature Review

Technology Based Scaffolding

Shih et al. (2010) did a study called “The development and implementation of scaffolding-based self-regulated learning system for e/m-learning.” The purpose of this study was to look at a proposed system of scaffolding, using online and mobile technology, which would hopefully help secondary students become self-regulated learners as well as encourage students to work independently.

In order to evaluate their proposed system, Shih et al. (2010) designed a 2-step experiment. The first step was to identify which students were already showing characteristics of self-regulated learners in English (as a second language) and the second step was to identify what types of SRL characteristics the students displayed. In the first step, four 10th grade classes
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in Taiwan were required to participate in the study by self-regulating throughout English lessons for 10 weeks. The lessons came from an instructional magazine. The students were taught a few SRL strategies beforehand. The students were asked to write down their learning processes as well as a reflection on their learning. At the end of 10 weeks, the students filled out a MSLQ (Motivated Strategies for Learning Questionnaire). Some items in the questionnaire included: “I believe I will receive an excellent grade in class” and “I am very interested in the content area of English learning.” In the second step of the study, seventeen 11th grade student volunteers were involved for 3 weeks. Each of the 17 students was given a tablet PC among other items that could be used for online and mobile learning. The students took an identical pre-test and post-test before and after the study to determine the SRL strategies used by the students before and after the use of the proposed scaffolding system. The students filled out a total of 2 questionnaires: the MSLQ, as well as a SRSIQ (Self-Regulated System Indication Questionnaire). The purpose of the SRSIQ was to determine the effectiveness of the scaffolding system.

The results demonstrate that there was some improvement in the SRL skills of the students, but as the authors point out, “the improvement was not significant” (Shih et al., 2010, p. 91). The system did, however receive positive reviews from the students involved. The consensus was that the system was “user-friendly and could give them valuable progress in SRL” (Shih et al., 2010, p. 91).

The fact that the improvements in students’ self-regulated learning skills were not significant, but the students enjoyed the system is not enough to say that this scaffolding approach was effective. Students could enjoy what they are doing, but that doesn’t mean what they are doing is benefitting them especially in terms of the development of the self-regulated learning skills. I also think that the items in the MSLQ didn’t adequately address the skills
involved, but rather how students felt at the end of their learning. The authors stated, “Based on the suggestions of the students, we will make the interfaces of the SRL system more user-friendly and improve the recognition ratio of the Hyperpen to facilitate its operations” (Shih et al., 2010, p. 91). I think that a survey to evaluate what SRL processes the students used as a result of the use of the scaffolding system would be helpful and beneficial. This type of survey is demonstrated in the following study done by Dabbagh & Kitsantas (2005).

The study by Dabbagh & Kitsantas (2005) was called “Using web-based pedagogical tools as scaffolds for self-regulated learning.” The purpose of this study was to investigate whether or not self-regulated learning (SRL) processes vary depending on student use of different web-based pedagogical tools (WBPT). In other words, are SRL processes such as goal-setting and self-monitoring dependent on the WBPT used (i.e. collaborative and communication tools, content creation and delivery tools)?

Sixty-five students, ages 22-45, participated in this study. Students were in three college courses that involved the use of a Course Management System (CMS). At the beginning of the study, all of the students filled out a personal data questionnaire in which they were asked questions about their age, gender, and major in school. The students then filled out a Motivated Strategies for Learning Questionnaire (MSLQ). The purpose of this questionnaire was to see if the students’ SRL differed between the different classes. Students rated SRL behaviors on how they related to their studying. Throughout the semester, the students completed a variety of assignments and activities, including individual activities, team activities, and other collaborative learning assignments. At the end of the semester, all of the students filled out a third questionnaire, the Web Supported Self-Regulation Questionnaire (WSSRQ). This questionnaire was used to see if the types of WBPT (i.e. content creation and delivery tools, collaborative and
The effects of scaffolding on students’ self-regulated learning skills (i.e. goal-setting) led to the processes of SRL being demonstrated by the students.

For each of the different SRL characteristics, there was a significant effect from the WBPT. Goal-setting was more likely to occur in collaborative and communication based assignments. Administrative tools and assessment tools were most beneficial in leading to self-monitoring as well as self-evaluation processes among the students. In short, different types of WBPT supported different SRL characteristics.

The results of this study were determined based on the WSSRQ, and the items in the survey were based on self-regulated learning skills such as self-evaluating, goal-setting, etc… The researchers were able to find a significant effect of their computer scaffolding on each of the SRL characteristics they looked at. The WSSRQ presented the significant results that the Shih et al. (2010) study didn’t. Something that was similar between this study and the Shih et al. (2010) study is that the results were based on students’ perceptions, which could or could not be biased on the part of the students. I wonder if a student’s perception of a certain assignment could affect how they use their SRL skills. The following study done by Molenaar et al. (2010) looks at the quantity of skills demonstrated directly, rather than having students fill out a survey.

Molenaar et al. (2010)’s study was entitled “The effects of scaffolding metacognitive activities in small groups. The purpose of this study was to determine if the scaffolding of metacognitive skills or activities has an effect on the quantity of metacognitive skills demonstrated by students. This study also looks to see if there is a difference between types of scaffolds (structuring v. problematizing).

In this study there was a sample size of 54 students (23 boys, 31 girls) that were randomly assigned to 6 control triads, 6 triads in the structuring condition (structuring scaffolds),
and 6 triads in the problematizing condition (problematizing scaffolds). In this study a triad was a group of three students: one high achieving student, one middle achieving student, and one low achieving student. The different conditions (structuring and problematizing) represented the different types of scaffolding administered. Structuring scaffolds give examples of the metacognitive activities, while problematizing scaffolds pose probing questions that require the use of the students’ metacognitive abilities. The students in the study participated in an online learning environment in which the scaffolding had been embedded. They were participating in six one-hour lessons. Each of the students was required to speak out loud their processes during the lessons, while their voices were being taped. The quantity of metacognitive activities was recorded.

The experimental group demonstrated a higher quantity of metacognitive activities than the control group, which says that scaffolding in general had a big effect on how many metacognitive activities were demonstrated by the students. In terms of the different types of scaffolding (structuring v. problematizing), there was not a significant difference between the amount of metacognitive activities in the structuring and problematizing groups.

The results of this study show that scaffolding can increase the quantity of metacognitive activities and self-regulated learning skills demonstrated by students. This study measured the skills demonstrated by students in terms of quantity, rather than by student perception as the studies by Shih et al. (2010) and Dabbagh & Kitsantas (2005). By doing this, the researchers could see just how many skills the students used. The results that stated that there was no significant difference between the amounts of metacognitive activities between the two scaffolding groups were interesting. The results indicated that the type of scaffolds given to students did not matter. This is somewhat different from the results in the Dabbagh & Kitsantas
(2005) study which presented the idea that different web-based scaffolding supported different types of self-regulated learning skills. The following study done by Molenaar et al. (2012) suggests that the type of scaffolding matters and it depends on the students’ behavior while completing a task.

The study done by Molenaar et al. (2012) was “Dynamic scaffolding of socially regulated learning in a computer-based learning environment.” The purpose of this study was to look at the effects of dynamic scaffolding on students’ self-regulated learning strategies in a computer-based learning environment. In this study, dynamic scaffolding involves analyzing a student’s behavior and then determining the appropriate type of scaffold (cognitive or metacognitive) based on that behavior as well as the task at hand. As dynamic scaffolding is a type of scaffolding, the scaffolds will eventually fade.

110 students in the Czech Republic were the participants in this study. The students were 5th graders who were grouped into pairs. Each pair consisted of one low and one high achieving student of different genders (one boy and one girl). The teachers determined whether each student was a low or high achiever based on their reading, writing, and computer abilities. All of the pairs were assigned to one of the two scaffolding conditions. Students in the control condition received no scaffolds, and students in the experimental condition did receive scaffolding support. The scaffolds were virtual, meaning they were embedded in the computer learning environment. The students participated in 6 lessons, and each lesson lasted 45 minutes. The assignment that the students worked on was called “Would you like to live abroad?” The students were required to learn about New Zealand, write a report about what they learned, and then decide if they would want to live there. The pairs were working in an online learning environment in which they asked questions to an “expert” who was from New Zealand. The
expert was available to answer questions from the students and provide information about the country of New Zealand. At the end of the study, the content/domain knowledge of each individual student was measured.

The results demonstrated that dynamic scaffolding led to better student papers and more questions posed to the expert from the students. It did not, however, lead to an increase in content knowledge.

This study focused only on dynamic scaffolding and how it relates to the self-regulated learning skills of students. It stated that the type of scaffolding that should be administered depends on the behavior of the student and the task that they are required to complete. It seems to me that these aspects need to be taken into consideration before deciding if a student requires any type of scaffolding. Content knowledge of the students in this study didn’t increase by the end. The goal of scaffolding in terms of self-regulated learning among students, in my opinion, would be to guide the students to develop their self-regulated learning skills so that they can increase the amount and depth of their content knowledge. So, although the dynamic scaffolding in this study led to better student papers and more questions asked by the students, it didn’t increase the students’ overall content knowledge. I would say that content knowledge needs to be considered when determining the effectiveness of scaffolding on the students’ self-regulated learning skills.

Parent Scaffolding

Neitzel & Stright (2003) did a study titled “Mothers’ scaffolding of children’s problem solving: Establishing a foundation of academic self-regulatory competence.” The purpose of this study was to see if there is a relationship between mothers’ scaffolding of their pre-school children and their child’s self-regulatory behaviors in school. The author’s predicted that the
scaffolding that children receive from their mother would probably not be enough, and that other factors (i.e. motivation) would lead to a child not bringing the self-regulatory skills with them when they start school.

68 family pairs, consisting of a pre-school child and their mother, participated in this study. The families were from a university city in the Midwest as well as from the communities surrounding it. The mothers came from a variety of educational backgrounds (some received college, some received some graduate school, etc…). 55 of the mothers were married and 13 were single and the head of household for their family. 52 mothers had jobs. 32 children were male and 36 were female. Most of the children (60 out of 68) were white. Each mother-child group was visited for 1.5 hours over the course of the summer before the child was going to begin kindergarten. The child participated in four difficult problem-solving activities in which mothers would need to scaffold the students through. The mothers’ scaffolding was assessed using a coding system. The mother’s cognitive support, emotional support, and transfer of responsibility were coded and rated on a scale from one (low) to five (high). Five aspects of the child’s self-regulatory behaviors were observed and coded using frequency counts. Metacognitive talk, task persistence, behavior self-control, monitoring progress, and seeking assistance were the five aspects observed.

The mothers’ scaffolding was significantly related to the children’s metacognitive talk in school. If the mothers provided their child with metacognitive information, their child was more likely to discuss how answers to the activities were reached. The mothers’ scaffolding was also significantly related to their child’s task persistence, monitoring of progress, and help seeking abilities. Their scaffolding was not, however significantly related to their child’s lack of behavior control.
The results of this study are suggesting that mothers’ scaffolding of their child’s metacognitive skills could help to prepare children for self-regulated learning in school. Mothers could scaffold their children while practicing activities and prepare their children to monitor their progress and display other self-regulated learning skills. The results do say, however that scaffolding was not significantly related to a child’s lack of behavior control. Another study should be done to address why mothers’ scaffolding didn’t significantly relate to this characteristic. This study looked at how scaffolding by one parent affect children’s’ SRL skills, while the following study by Nader-Grosbois & Lefèvre (2012) looked at how scaffolding from both a mother and a father affects the self-regulated learning skills of their children.

Nader-Grosbois & Lefèvre (2012)’s study is called “Parents’ regulation and self-regulation and performance in children with intellectual disability in problem-solving using physical materials or computers.” The purpose of this study was to look at parents’ (mothers’ and fathers’) scaffolding of children with intellectual disabilities (ID) and parents’ scaffolding of typically developing (TD) children while their child is completing various problem-solving tasks. The researchers looked to see if parents’ regulation strategies depended on their child’s characteristics (ID or TD) and if their scaffolding led to an increase in self-regulatory learning skills in their children.

29 mothers and 29 fathers of ID children, as well as 30 mothers and 30 fathers of TD children were the participants in this study. The ID children’s ages ranged from 73 to 249 months and the TD children’s ages ranged from 35 to 71 months. The problem solving tasks were set up in a laboratory environment. Some of the tasks involved working on a computer while other tasks involved the use of physical materials. The children worked on each task for 10 minutes. Seven strategies of scaffolding were considered: “support with identification of
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objective, with planning, with joint attention, with behavior regulation, with attention, with motivation, and with evaluation” (Nader-Grosbois & Lefèvre, 2012, p. 452). The self-regulation strategies of children that were considered were: self-identification of objective, self-planning, joint attention, behavior regulation or request, self-attention, self-motivation, and self-evaluation.

A negative and significant relationship between fathers’ scaffolding and child self-regulation in both groups (ID and TD) with physical materials was found, as well as a negative and significant relationship between mothers’ scaffolding and child self-regulation in the TD group with the use of the computer. No difference was observed between the support given by parents with ID children and the support given by parents with TD children. The better the children seemed to be doing while completing a task, the less support/scaffolding the parents gave, and vice versa. Parents’ regulation depended on their child’s ability to self-regulate. Intrusive behavior on the part of the parents negatively affected their child’s performance on the tasks.

This study’s results find a negative significant relationship between scaffolding from fathers and their child’s self-regulation while using physical materials. This was true for both ID and TD children. This suggests that the background of the child (ID or TD) didn’t affect their development SRL skills as a result of scaffolding. A negative significant relationship would entail that as the fathers provided scaffolding it would potentially decrease the SRL skills demonstrated by their child. This was also true with mothers and TD children while using the computer to complete tasks. The results of this study and the results of the study done by Neitzel & Stright (2003) were different. The Neitzel & Stright (2003) study found a significant relationship between parent scaffolding and the development of SRL skills by the child, while this study found a negative significant relationship. I wonder if 10 minutes on each task was not
enough time for the students to develop their SRL skills. In the Neitzel & Stright (2003) study the mothers and children were visited for a total of 1.5 hours. Intrusive behavior on the part of the parents also could’ve caused a decrease in the self-regulated learning skills demonstrated by the children. It seems that children would need an appropriate amount of time to develop their self-regulated learning skills, and parents would need to provide nonintrusive scaffolding to their child while they are completing a task.

**Peer Scaffolding**

Pifarre & Cobos (2010) conducted a study called “Promoting metacognitive skills through peer scaffolding in a CSCL environment.” This study looked to investigate how scaffolding from peers in a CSCL (Computer Supported Collaborate Learning) environment affects the metacognitive skills and self-regulated learning skills of students.

This study was in the format of a case study in which 18 college students used the CSCL system over the course of two terms (semesters). The students were all taking 2 related classes: “Instructional Psychology” and “Learning Strategies” (Pifarre & Cobos, 2010, p. 243). Two instructors also participated in the study. Both instructors taught “Instructional Psychology,” but only one of the instructors taught “Learning Strategies.” In the CSCL environment, students would be looking at how their classmates completed a task, and then giving advice on how they could improve it. The instructors and students collaborated and discussed what specific things they should scaffold. They decided it would be important to scaffold regarding “content adequacy, personal elaboration of the ideas, organization of the ideas, presentation strategies, and conclusions” (Pifarre & Cobos, 2010, p. 244). The students’ task was to do the following: (1) Read information about a topic, (2) Write a report about the topic and submit it to the CSCL environment, (3) Read and comment on a peer’s report in order to scaffold them and help them...
to improve their work, (4) Read their classmates’ comments on their own report, adjust it accordingly, and then resubmit it, and (5) vote for the best report of the class. The notes and comments that the students wrote to their classmates were analyzed in terms of the metacognitive processes that their comments required of them. Processes include: planning, maintaining clarity, and monitoring.

Over time (2 terms), the notes and comments written by the students showed an increase in the metacognitive skills that were used. The metacognitive skill that was seen most often was in the “planning” category. This was followed by the “monitoring” category then the “maintaining clarity” category. These results were true for both semesters of the study. Something interesting to note, however is that the “maintaining clarity” and the “monitoring” categories showed up more frequently from the first semester to the second.

The results show that there was an increase in metacognitive skills after the two terms. This study does not show, however if there was a significant relationship between the increase in skills and the peer scaffolding. Other factors could have played a part in the increase such as the scaffolding of skills from other classes or from other sources such as other teachers or possibly from parents. It was interesting that two skills (maintaining clarity and monitoring) increased from one semester to the next. This study was different from the two studies on parent scaffolding in that the students had more time (2 semesters) to develop their skills. The students could have, however also had some prior self-regulated learning skills already as they were college students. This study does not demonstrate any relationships, so a correlation study should be done to see if this method of peer scaffolding has the potential to be effective in increasing the self-regulated learning skills of students. A study should also be done to see if peer scaffolding could be effective at other levels (elementary and/or secondary).
Teacher Scaffolding

The following study by Azevedo et al. (2004) is called “Does adaptive scaffolding facilitate students’ ability to regulate their learning with hypermedia?” The purpose of this study was to determine if a student’s deep understanding of a topic would benefit from receiving different types or amounts of scaffolding. This study looked to understand how different methods of scaffolding could affect a student’s ability to self-regulate their learning in a multimedia environment.

The participants in this study were 51 undergraduate students, who consisted of 38 women and 13 men. These students were non-biology majors who were receiving extra credit in their educational psychology class as a result of participating in this study. At the beginning of the study, students were given a pretest to determine their current knowledge of the circulatory system. The test consisted of four parts (matching, labeling, flow, and essay). The participants were also given an identical posttest at the end of the study. The participants were randomly assigned into three different groups. Each group would receive a different amount of scaffolding or guidance with their work. One group would receive no scaffolding (NS). Another group would receive fixed scaffolding (FS), in which they would be given a set of goals to help guide their understanding of the circulatory system. The third group would receive adaptive scaffolding (AS), in which the students would have a tutor available to them in addition to the list of goals that was given to the group receiving fixed scaffolding. Scaffolding from the tutor would include: assisting the participants in planning their learning, helping students use different learning strategies, monitoring their understanding, etc… During the experiment the participants used a CD-ROM based encyclopedia to learn about the circulatory system. Students looked at various sources of information that included text, diagrams, photographs, and animations.
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In each of the three scaffolding conditions, one participant was described in order to highlight the characteristics of self-regulated learning demonstrated by the entire group. In the AS condition, the student demonstrated a “feeling of knowing” (Azevedo et al., p. 360). This means that the student feels they have some understanding of the content. The student also demonstrated “prior knowledge activation” (Azevedo et al., p. 360), meaning the student could remember something they had learned before relating to the current topic. The student did not however, demonstrate self-questioning, which is a characteristic of self-regulated learning. In the FS condition, the participant demonstrated “goal-directed learning” (Azevedo et al., p. 360). The participant based her searches as well as her evaluation of her learning on the goals that were provided to her. The student didn’t take any notes throughout her research. Finally, in the NS condition, the participant created her own goals. The student demonstrated goal directed searches in the encyclopedia, but the searches were based on self-made goals. The participant didn’t show any kind of progress monitoring throughout her learning. All of the participants, regardless of which group they were in, demonstrated a high amount of summarizing of the content.

This study looked at different types of scaffolding done by teachers, fixed scaffolding and adaptive scaffolding. The results show that adaptive scaffolding seemed to be the most effective. Students in the AS condition demonstrated prior knowledge activation and a feeling of knowing. Students in the FS condition only demonstrated goal-directed learning and students in the NS condition demonstrated some goal-directed learning. It is interesting that the students demonstrated a high amount of summarization with the content. The students summarized content, which makes it difficult to determine if they had an increase in content knowledge as a result of the scaffolding. As stated previously, an increase in content knowledge should be considered when determining the effectiveness of scaffolding techniques. The following study by
Azevedo et al. (2005) looks at adaptive scaffolding again while also looking at the content knowledge gains of high school students.

Azevedo et al. (2005)’s study was called “Adaptive human scaffolding facilitates adolescents’ self-regulated learning with hypermedia.” The purpose of this study was to see how three different scaffolding techniques affect high school students’ SRL in a hypermedia (online) learning environment. This study is similar to Azevedo et al. (2004)’s earlier study on the effects of scaffolding on the SRL of undergraduate students.

111 high school students participated in this study. Students were given a pretest about the circulatory system before beginning their learning. This pretest was shorter than the one in the earlier study, but contained a matching section, a labeling section, and an essay section. The learning environment was like the one used in the original study in which students were using a CD-ROM encyclopedia to learn about the circulatory system. The same scaffolding conditions that were used in Acevedo et al. (2004) study. The conditions were: no scaffolding (NS), fixed scaffolding (FS), and adaptive scaffolding (AS). Students in the NS condition were only given an online learning goal to guide their learning. Students in the FS condition were also given the same learning goal, but were additionally given 10 questions to look at in order to guide their thinking. Finally, students in the AS condition were given access to a human tutor in addition to what students in the other two scaffolding conditions were given. Students were again required to verbalize their thought processes. At the end of the study a posttest was given that was identical to the pretest.

Adaptive scaffolding seemed to be the most effective in enhancing students’ SRL processes as well as their understanding of the circulatory system. This is similar to the results in
the earlier study. Students in the AS condition also seemed to be the only group to gain a deep understanding of the circulatory system.

This study was similar to the Azevedo et al. (2004) study in that they both looked at adaptive and fixed scaffolding, but this study worked with high school students and the results showed that students gained a deeper understanding of the content. It is interesting that only students in the AS condition seemed to gain a deep understanding of the circulatory system content. This would suggest what the previous study suggested, which is that AS is the most effective. AS seemed to enhance students’ self-regulated learning processes and give them a deep content understanding. The understanding of content was not entirely evident in the previous student because the students were just summarizing information. The following study by Ifenthaler (2012) looks at scaffolding in terms of different types of prompts.

Ifenthaler (2012)’s study had the title “Determining the effectiveness of prompts for self-regulated learning in problem-solving scenarios.” The purpose of this study was to find different types of prompts and to determine their effectiveness of enhancing the self-regulation of learning by students in a problem-solving environment.

98 college students from a college in Europe were the participants in this study. All of the students were in an introductory research methods class. The students were randomly placed throughout 3 different experimental conditions. Each condition was different in terms of the prompts given. A generic prompt (GP) requires students to think/reflect on their current learning, and a direct prompt (DP) gives students a model of thinking and/or problem solving. Students in the GP group were given instructions on how they could plan and reflect on their problem-solving strategies, students in the DP group were given 9 sentences that were about the planning, monitoring, and evaluation of problem-solving activities, and students in the control group (CG)
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did not receive any sort of thinking prompt. Data was measured using a pre and posttest consisting of multiple choice questions about the content, as well as through various surveys administered to the participants.

The results of this study showed that students in the GP group demonstrated higher content knowledge by the end of the study. The results suggest that generic prompts would be the most beneficial for students who already have basic self-regulated learning skills (i.e. college students). Students who don’t have some self-regulated learning skills (i.e. elementary-high school students) could find directed prompts to be more beneficial, however the results of this study can’t accurately support that claim.

Prompts are still considered scaffolding because they guide students’ learning in the preferred direction. In this case the preferred direction would be in the direction of developing self-regulated learning skills. The results show that generic prompts, when given to the students, led to the demonstration of higher content knowledge. A generic prompt requires students to think or reflect upon their current learning, while direct prompts give the students a model of thinking and/or problem solving to follow. Students who reflected on their current learning demonstrated a higher content knowledge. The authors stated that these results would be likely to be true for students who already have basic SRL skills. Another study would need to be done with students who have limited SRL skills to no SRL skills to identify if one, both, or neither of these types of scaffolding would be effective at increasing the self-regulated learning of those students.

Recommendations for Schools and Classrooms

There were three issues that the literature brought up in terms of the effects of scaffolding on students’ self-regulated learning skills. Issues include the amount of content knowledge
students demonstrate, the parental involvement in scaffolding, and the time available for students to develop and demonstrate the skills that they have learned.

The literature would suggest that scaffolding techniques that are effective would lead to an increase of content knowledge. Many of the studies that provided results in which students demonstrated SRL skills, involved scaffolding techniques that worked to improve content knowledge. For example, in the Azevedo et al. (2005) study adaptive scaffolding helped to increase the content knowledge of students. Their deep understanding was demonstrated by the verbalization of their thought processes. The results of the Azevedo et al. (2004) study demonstrate that scaffolding that leads students to only summarize the information would not increase their content knowledge. The students would not be thinking deep enough into the material. Schools and classrooms should provide scaffolding that involves prompting students with questions that lead them to think deeper. For example, a teacher could ask open-ended questions and questions that can’t be answered by using what is directly in front of them to help the students consider ideas that are connected in more in-depth ways. Asking students questions such as “According to your textbook…” will not produce the desired self-regulated learning skills. Summarizing will lead students to thinking that they can learn by just using what is in front of them and they will miss out on important ideas. By scaffolding students in this way, the students will eventually be able to ask themselves those same types of questions while learning on their own.

The literature raised the issue of parental involvement in the scaffolding of students’ self-regulated learning skills. Two studies addressed the idea of parental scaffolding: Nader-Grosbois & Lefèvre (2012) and Neitzel & Stright (2003). Nader-Grosbois & Lefèvre (2012)’s study suggested that intrusive behavior and scaffolding from the parents could lead to a decrease in
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task performance and the demonstration of SRL skills, while the Neitzel & Stright (2003) study suggested that mothers’ scaffolding had the potential to increase children’s SRL skills before beginning school. This literature would suggest that if parents were to be involved in the development of their child’s self-regulated learning skills, which they should be, they should do so in a way that will not discourage the students. Schools and teachers could provide parents with effective ways in which they could guide their students. Teachers could present families with a “Ways to guide your child through their learning.” I would recommend that teachers and schools require parents to read and sign the document. If schools could prove to parents that the document would be helpful for their child, it would persuade parents to read it. It is recommended that parents are supportive of their child in their development of SRL skills. Parents shouldn’t say things to their child such as “How do you not know what to do?” They should ask things such as “What’s another way you could solve this problem?” Parent and teacher/school communication will be essential in ensuring that parental involvement in their child’s self-regulated learning development is positive rather than negative.

The third issue raised by the literature is the time it would take for students to develop strong self-regulated learning skills. The development of student self-regulated learning will not occur “overnight.” The amount of time it takes to develop these skills will depend on the level of the student. In the Nader-Grosbois & Lefèvre (2012) study the children only had 10 minutes to work on a task, while in the Neitzel & Stright (2003) study the children were observed over the course of 1.5 hours. The children who had 1.5 hours to learn the skills demonstrated more metacognitive skills. Another example can be seen between the Pifarre & Cobos (2010) study and the Molenaar et al. (2012) study. In the Molenaar et al. (2012) study students were given 45 minutes to complete a lesson, while in the Pifarre & Cobos (2010) study, students were given 2
semesters to complete a task. The students in the Pifarre & Cobos (2010) study showed an increase in metacognitive skills and content knowledge, while the students in the Molenaar et al. (2012) study, students failed to gain an increase in content knowledge. Schools and/or teachers should give the students time to develop their skills. When planning, teachers should consider the task they are requiring from the students when determining how long to give the students to work on the task and to develop their skills. More in-depth understandings of a topic will take more time for students to grasp. Teachers should also give students numerous opportunities to use metacognitive skills to answer problems or to complete tasks. Problem-solving tasks in any of the content areas could give students an opportunity to self-regulate their learning. Scaffolding students throughout the tasks will help them to develop the metacognitive skills needed to self-regulate their learning.

Conclusion

Scaffolding from computer programs, parents, peers, and teachers are different sources that can guide students and help them to develop their self-regulated learning skills. The issues of content knowledge gains, parental involvement, and time are all issues that should be considered by schools and/or teachers when scaffolding students. Successful self-regulated learning should include gains in the students’ content knowledge. When parents are involved in their child’s self-regulated learning development, they should be supportive rather than intrusive. Finally, students should be allotted an appropriate amount of time to develop their SRL skills because they will not be learned right away. Scaffolding in schools in order to develop the self-regulated learning in students can be successful when schools, teachers, as well as parents consider these recommendations.
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References


