

Lessons from Research on Teaching and Learning: Service-Learning as Effective Instruction

Shelley H. Billig, Ph.D.
RMC Research
Corporation

Service-learning has enormous potential as a teaching and learning strategy for increasing academic engagement and performance. Research has repeatedly shown that participation in high-quality service-learning can result in improved attendance, increased test scores, greater problem-solving skills, and better acquisition of skills and knowledge related to reading/language arts, mathematics, science, and social studies (see a research review by Billig 2004, for example).

Unfortunately, recent evaluations have also shown that many service-learning practitioners (as many as two-thirds in some states) do not implement high-quality practices (National Research Council 1999).

In this article, high-quality practice will be defined, and suggestions for improving the practice of service-learning as a teaching and learning strategy will be given. The information provided here is based on decades of research on teaching and learning and on recent research on service-learning.

How Do People Learn?

In 1999, the National Research Council published a comprehensive review of the literature on human learning. This review explores multiple facets of learning, including the ways in which learning changes the physical structure of the brain, the influence of existing knowledge on what people notice and how they process information, strategies that enhance transfer of learning from one setting to another, and how teachers can organize their classrooms and their instruction to maximize learning.

Learning is, of course, an active and social process. Children are born with capacities for learning, and the environment provides both information and a structure for understanding the information. As they have new experiences, people try to make sense of what is happening by interpreting events using the knowledge they have acquired. From a very early age, children learn to make meaning of their experiences, solve problems, and develop an

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Lessons from Research on Teaching and Learning continued...

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understanding of their own learning capacities. Learning is dynamic and is shaped by the learners' social environment. Neurocognitive research shows that the brain literally becomes thicker and heavier as learning occurs.

What Learning Environments Are Associated with Knowledge and Skills Acquisition?

Educators can influence learning through the ways in which they interact with learners and develop a

learning environment. Though there is no single recipe for success, the National Research Council review demonstrated that four aspects of classroom designs are associated with increased learning. These were:

- Promoting a *learner-centered environment* helps students to build on what they bring to the classroom in terms of knowledge, skills, and beliefs about how the world operates. Teachers who uncover student predispositions can more easily help them construct meaning from their new experiences, correct misconceptions, and differentiate instruction so that all students can increase their knowledge and skills while feeling valued for who they are.
- Nurturing a *knowledge-centered environment* helps to ensure that students are learning the academic content expected for their grade levels and the need to grasp increasingly complex concepts over time. A knowledge-centered environment focuses on standards and specific information and skills to be mastered.
- Fostering an *assessment-centered environment* helps students receive feedback in a productive manner and gives teachers information for improving instruction. Particularly important here is the clarity of



learning expectations and the implementation of assessments that are formative (informal assessment used for improvement) and summative (formal assessments that measure learning in a high-stakes environment). Regularly administering assessments to determine whether students have learned specific objectives or standards can help the teacher know how well

students are likely to perform on high stakes tests.

- Engaging students in a *community-centered environment* gives students a sense of belonging to something greater than themselves. Norms for cooperation and direct contact with those being served help promote the feeling of connectedness.

What Factors Are Associated with Transfer of Learning?

Transfer of learning refers to students' abilities to apply what they have learned in one setting to another. Transfer may occur from one set of concepts to another, one content area to another, one school year to another, or from school to other activities. According to the National Research Council (1999), students' ability to transfer is dependent on:

- the degree to which initial learning of foundational information occurred;
- deliberate practice that helps students monitor and correct their learning;
- the degree to which knowledge has been taught in a variety of contexts;
- explicit learning about how and when to put knowledge to use; and
- the degree to which students have at least some understanding of the new context in which they are to apply what they learned.

Sometimes prior learning, especially when the home culture and the school culture are very different, can actually inhibit transfer because



Photo courtesy of CNCS.

students have different cultural understandings. In these situations, teacher facilitation of learning is critical to help enlarge students' perspectives and gain deeper understandings of the world.

Teachers can help students learn how to apply what they learned from one setting to another when they assist students in developing problem representations or multiple ways to state and understand a problem. Specifically, teachers should help students learn how to organize knowledge, develop strategies for inferring meaning, and promote higher order thinking skills such as evaluation, critique, and perspective-

taking. Practice in applying knowledge from one setting to another helps to enhance the development of these skills.

What Factors Are Associated with Engaging Students in Academics?

In 2004, the National Research Council published a summary of the research on high school engagement with the recognition that without engaging students more actively, schools cannot be effective at teaching and learning. School engagement includes both *behaviors* such as effort, attention, and persistence and *emotions*, such as interest, enthusiasm, and value placed on

Lessons from Research on Teaching and Learning continued...

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schooling. Engagement at school is more encompassing than motivation to attend school since engagement includes “psychological investment in and effort directed toward learning...the knowledge, skills, or crafts that academic work is intended to promote” (Newmann, Wehlage, and Lamborn 1992, 12).

Engagement is influenced by educational context, such as school climate and size, instructional delivery, individuals’ beliefs about competence and control, and their values, goals, and social connectedness. Many of these sources of influence on engagement can themselves be affected in the context of service-learning practice. This National Research Council (2004) report specifically suggests the use of service-learning as an important engagement strategy for high school, implicitly recognizing that service-learning incorporates many of the research-based factors associated with student engagement in academic work. Results summarized in this document include the following:

Schools that engage students build students’ competence and give them some control over their own learning. Tasks should be challenging but achievable, and adjusted to students’ skill levels. There should be high expectations for student learning and

high “academic press” defined as demanding curriculum without pressuring performance or undermining autonomy. Evaluation should be regular, varied so that competence can be demonstrated in multiple ways, and based on clearly defined criteria, with specific and useful feedback to guide future efforts.

Engaging schools were also found to promote academic values and goals. Students value education when they are reinforced for behaviors that show the importance of education, have role models who are committed to education, and are encouraged by teachers and peers to pursue educational opportunities. Students become more engaged in schools that place a strong emphasis on higher order thinking skills, active participation, collaboration, and meaningful connections to students’ culture and lives outside school. Students become more cognitively engaged when they are pushed to understand or asked to wrestle with new concepts. However, students should be provided with appropriate levels of challenge so that they do not become frustrated or bored.

Engaging schools have teachers who use varied instructional techniques, including hands-on experiences, discussion, and many other activities. Engaging tasks are

often open-ended, incorporate multiple intellectual activities, and foster both group interdependence and individual responsibility. Research shows that connecting activities to the big ideas from a discipline better illuminates learning objectives for students and helps them to retain and apply knowledge and skills. Students also learn and retain more when they view tasks as personally relevant.

Finally, the research shows that *engaging schools promote a sense of belonging*. This includes a feeling of being valued by the teacher and other students. Students who believe they are treated unfairly or feel their teachers do not care become disengaged. Teachers need to take the time to learn about their students, especially their strengths and interests. If students look confused, teachers should prompt them, in a way that is inviting and not critical, to ask clarifying questions. Teachers should promote a culture of respect and caring by setting ground rules in class about treatment of others and serving as a role model for respect, caring, fairness, and responsibility.

What Instructional Strategies Are Associated with Academic Achievement?

Finally, to improve academic outcomes, it is instructive for service-learning practitioners to examine the literature on instructional strategies associated with the greatest achievement gains. For this

purpose, a subset of the strategies reviewed by Marzano (2003) and Marzano, Pickering, and Pollack (2001) are presented here.

In his meta-analysis of the research, Marzano (2003) identified nine instructional strategies that have been shown to have a strong relationship to student achievement. They are:

- identifying similarities and differences
- summarizing and note-taking
- reinforcing effort and providing recognition
- homework and practice
- nonlinguistic representations
- cooperative learning
- setting objectives and providing feedback
- generating and testing hypotheses
- questions, cues, and graphic organizers

Each of these is relatively easily woven into service-learning practice. For example, reflections could involve the development of metaphors or analogies, or comparing and classifying experiences. Students could storyboard their activities, each adding new information to the storyboard as it develops. Planning could involve simulations or modeling. Students could generate hypotheses about what they think will happen before they provide service, and then collect data to support or refute their hypotheses. As they engage in service, students could write essays connecting their newly acquired knowledge to

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High-quality service-learning is good teaching and learning.

standards or to what they believed before they engaged in the service and how the service was personally relevant. Students could take turns summarizing the planning meetings, service experiences, or learning expressed in reflections. The possibilities for linking to these factors are virtually unlimited.

What Does the Research on High-Quality Service-Learning Practice Show?

Recently completed studies such as the one by Billig, Root, and Jesse (2005) have begun to identify factors within the practice of service-learning that are most highly correlated with impact on students. Five factors emerged as being statistically significant across multiple studies. They are:

- a strong link between the service-learning activities and content standards

- direct contact with those being served
- cognitively challenging reflection activities
- youth choice in planning and implementation of service-learning activities
- the duration of at least one semester

In two other studies, meeting authentic community needs, public demonstration of learning, and respect for diversity also were identified as being significantly related to impacts (Billig 2005).

These components are directly related to the more general teaching and learning research cited above, making the case that high-quality service-learning is good teaching and learning. As more of the research on effective practice is woven into the service-learning experience, outcomes should become more robust.

What Should Service-Learning Practitioners Do?

Incorporating research-based evidence on effective teaching and learning strategies into service-learning practice is not hard to do — it just takes time to create and weave these factors into service-learning experiences. The matrix on the next page provides some practical guidance and examples of how this can be done. **G2G**

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How to Integrate the Research on Effective Teaching and Learning into Service-Learning Practice

What the Research Says	Implications for Service-Learning Practice
<p>Become more learner-centered.</p>	<ul style="list-style-type: none"> • Become familiar with each student's level of knowledge, skills, strengths, and interests through preparation activities such as discussion and assessment. Allow students to take on different roles within the service experience and give them multiple ways to reflect. • Uncover misconceptions. Through pre-reflection activities, discover what students think about the service setting and the problems they are likely to encounter. Discuss understandings sensitively, and provide experiences and facilitation to help students readjust ideas, building on the conceptual and cultural knowledge they have. • Use prediction. Ask students what they think will happen and why, then engage in service, and finally reexamine what happened to help them see how and why their ideas should change. • Engage in scaffolding. Discuss students' previous experiences in making meaning of the service event. Ask students to think about experiences they have had in helping others and define similarities and differences. Ask students to take the point of view of those being served and ask them to discuss how service recipients feel. Help students see connections between what they know and what they are learning. • Provide connections between structural and social learning. Create opportunities to discuss both what was learned and how students relate personally to the learning.
<p>Become more knowledge-centered.</p>	<ul style="list-style-type: none"> • Focus on content standards. Help students learn the knowledge and skills expected for their grade level. • Help students develop comprehension strategies. Assist students in making sense of new ideas through "cognitively guided" instruction that illuminates what they are expected to learn. Illustrate what to do when you bump into the unfamiliar or need to solve a problem. • Foster integrated understandings. Help students develop more coherent thinking by showing them how to connect disciplinary knowledge and skills. • Strike an appropriate balance between activities designed for comprehension and those designed for automaticity. It is important for students to acquire skills related to reading, writing, and computation so that those skills become foundational and automatic.
<p>Become more assessment-centered.</p>	<ul style="list-style-type: none"> • Use formative assessments for feedback. Students' thinking should be made visible through various assignments such as written reflections, discussions, or tests. This allows the teacher to understand the impact of the experience and to provide feedback and additional learning experiences if needed. • Assess for understanding of both content and process. Assessments should not just require memory for procedures or facts, but rather emphasize understanding. Illuminating both what students know and how they came to know it helps improve teaching and learning. • Make assessments continuous but not intrusive. Much assessment is informal, with teachers observing or asking questions and then helping students. Feedback is most valuable when it can be used to revise thinking as students are working on a service-learning project. • Help students become adroit at self-assessment. Self-assessment and assessment of others in a low-stakes, noncompetitive way helps students improve and to help others improve. • Use assessment results to improve teaching. When many students have difficulty mastering knowledge or skills, teachers may need to change their instructional approaches or the learning task. • Link formative and summative assessments. Good formative assessments predict the results of summative assessments, such as test scores. Be sure to align the assessments used.
<p>Become more community-centered.</p>	<ul style="list-style-type: none"> • Promote social norms that value understanding and making mistakes in order to learn. Allow students to have latitude for the design of their service-learning projects, even though they may not be totally successful. Let students make mistakes, then guide their discussion to uncover why mistakes were made and how they could improve their work. Give them the opportunity to do things differently to see the difference in outcomes. • Help students become a community of learners. Promote cooperation among students to accomplish various tasks and ask students to illuminate their thinking to help others. Use competition judiciously to encourage rather than impede learning by allowing multiple pathways to success.

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Lessons from Research on Teaching and Learning continued...

How to Integrate the Research on Effective Teaching and Learning into Service-Learning Practice (continued)											
What the Research Says	Implications for Service-Learning Practice										
Become more community-centered. <small>Continued from previous page</small>	<ul style="list-style-type: none"> • Provide ways for students to demonstrate their knowledge publicly. Preparing for outside audiences increases motivation to learn and helps to solidify the knowledge and skills acquired. 										
Promote perceptions of competence and control.	<ul style="list-style-type: none"> • Give students choices in planning, implementation, and evaluation practices. Service-learning activities should be designed to help students gain a sense of competence and confidence, with increasing challenge over time. • Define learning expectations. Expectations should be clearly defined and students should receive feedback regularly on their performance. • Maintain high expectations. High expectations should be communicated directly and indirectly, and curriculum should not be “watered down” for students. 										
Promote academic values and goals.	<ul style="list-style-type: none"> • Promote intrinsic motivation to learn. Rather than reminding students that they need to complete the service-learning assignment for a grade, point out what they will learn and why this learning is important. • Weave higher order thinking skills into all phases of the service-learning experience. • Use multiple and varied types of active learning strategies such as hands-on preparation and reflection activities in addition to the service activities. • Build service-learning assignments that require interdependence and autonomy. Help the group find ways to work together, promoting both group and individual responsibility. • Facilitate reflection activities that help students see the linkage between their activities and curriculum objectives and learning constructs. • Purposefully scaffold learning to students’ lives and experiences. Give students a chance to express their opinions or points of view. Build in ways to be respectful of other cultures and to deepen understandings based on perspective-taking. 										
Promote a sense of belonging.	<ul style="list-style-type: none"> • Take the time to learn about your students. Ask them about their strengths and interests. If students look confused, ask them to discuss the situation and ask clarifying questions. • Promote a culture of respect and caring. Set ground rules in class about treatment of others and serve as a role model for respect, caring, fairness, and responsibility. 										
Promote transfer of knowledge.	<ul style="list-style-type: none"> • Help students develop problem representations. Help them learn how to organize knowledge and develop strategies for inferring meaning. • Promote higher order thinking skills such as summarizing, evaluating, predicting, showing similarities and differences, and representing in nonlinguistic terms. Practice applying new skills. 										
Weave instructional strategies with strong influences on achievement.	Incorporate strategies known to be linked to academic achievement, including: <table border="0" style="width: 100%;"> <tr> <td>• identifying similarities and differences</td> <td>• summarizing and note-taking</td> </tr> <tr> <td>• reinforcing effort and providing recognition</td> <td>• homework and practice</td> </tr> <tr> <td>• nonlinguistic representations</td> <td>• cooperative learning</td> </tr> <tr> <td>• setting objectives and providing feedback</td> <td>• generating and testing hypotheses</td> </tr> <tr> <td>• questions, cues, and graphic organizers</td> <td></td> </tr> </table>	• identifying similarities and differences	• summarizing and note-taking	• reinforcing effort and providing recognition	• homework and practice	• nonlinguistic representations	• cooperative learning	• setting objectives and providing feedback	• generating and testing hypotheses	• questions, cues, and graphic organizers	
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Build on the service-learning components shown to influence results.	<ul style="list-style-type: none"> • Link service-learning experiences to content standards. • Provide opportunities for direct contact with service recipients. • Develop cognitively challenging reflection activities. • Let students have a voice and choice in planning, implementation, and reflection. • Plan service-learning activities that last at least one semester. 										